

ENGINEERS PLANNERS SURVEYORS

***ADDENDUM TO THE 8/27/07
TECHNICAL INFORMATION
REPORT***

for

**BURKE GILMAN TRAIL
RECONSTRUCTION**

100% Submittal

April 7, 2010

Prepared For:

MacLeod Reckord
231 Summit Avenue East
Seattle, WA 98102

Prepared By:

PACE Engineers, Inc.
1601 2nd Avenue, Suite 1000
Seattle, Washington 98101-3511



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This addendum addresses comment numbers 1 and 2 given in the August 18, 2009 Memorandum from Jason Henry at Hammond Collier Wade Livingstone to Stephen Bennett at the City of Lake Forest Park. This addendum is intended to supplement and update the August 27, 2008 TIR and 1st Addendum issued September 30, 2008. Where these documents conflict, this addendum takes precedence. The comments addressed by this addendum are as follows:

- 1) The technical information report for the project will need to be updated with the design revisions that are recommended in the level 2 downstream analysis. This includes discussion of the trail cross slope through stations 14+45 to 18+65, discussion of the underdrain system and other improvements added as a result of the level 2 downstream analysis. Station 14+45 appears to be a typo as it is within the section titled 17+00 to 17+45. Even so I would recommend beginning full cross slope to the west at station 17+00 to collect the added impervious area due to the intersection return and prevent surface water from upslope crossing between 17+00 and 17+45. The vertical geometry in this location will provide gutter flow to the low point at station 18+05 where surface water will be collected by the existing catch basin and conveyed to the lake.*
- 2) Station 19+50 to Station 23+54. The downstream analysis states that the trail slopes to the west for most of the length through this section and identified a house that is currently experiencing flooding/surface water issues. The proposed mitigation does not appear to be adequate. The vegetated flow path is only 5 feet, half of what is required by code to qualify as a BMP. Because the flow patterns will be changing in this area and there is an existing drainage problem we would recommend the City request additional mitigation for surface flows.*

The following is a listing of the recommendations given in the June 19, 2009 Level 2 Downstream Analysis. The discussion includes an opinion of consistency with the August 27, 2007 TIR and a description of changes where recommendations differ from the TIR. All items from comments 1 and 2 above are addressed within the discussion on these segments.

Segment A, Station 0+00 to 4+00

Recommendations:

- 1) Slope trail toward the lakeside such that runoff sheet flows through the gabion wall.



- 2) Owners of downstream properties should maintain existing stormwater controls as necessary.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.

Segment A, Station 4+00 to 7+80

Recommendations:

- 1) Slope trail toward the lakeside.
- 2) Installation Type 1 catch basin at road surface under the outfall from CB 12B. Extend new storm pipe north to connect to existing system.
- 3) Owners of downstream properties should maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR. An additional catch basin and approximately 170 lineal feet for 12-inch storm drain has been added downstream of the cross culvert located near station 5+61.

Segment A, Station 7+80 to 8+20

Recommendations:

- 1) Maintain existing cross-slope pattern towards lake side of the trail.
- 2) Owners of downstream properties should maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.

Segment B, Station 17+00 to 17+45

Recommendations:

- 1) Begin transition of cross-slope in this area so that by station 14+45 the trail is cross-sloped west.
- 2) Owners of downstream properties should maintain existing stormwater controls.



Discussion:

These recommendations update the previous plans and TIR submitted to the City. Please note that station 14+45 was a typo in the downstream analysis. The recommendation was meant to be at station 17+45. However, per recommendation of the City's drainage reviewer, the cross-slope has actually been started sooner so that by station 17+00 there is a full westerly cross-slope of 1%.

Segment B, Station 17+45 to 18+65

Recommendations:

- 1) Maintain cross-slope of the trail towards the upslope (west) side to maintain existing drainage patterns at this street end and associated driveway crossings.
- 2) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations update the previous plans and TIR submitted to the City. Additional drainage controls have been included in the revised plans including a high capacity inlet at approximate station 18+05, and a pipe and CB system extending northerly from this crossing to approximate station 20+50.

Segment B, Station 19+50 to 23+54

Recommendations:

- 1) Slope trail towards lakeside along this stretch of trail.
- 2) Provide vegetated flow path as backup BMP.
- 3) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR. However, the City drainage reviewer has requested (see comment #2 above) that additional mitigation for surface flows be provided at this location. This is based on a home that was identified during the joint field walk as having existing drainage problems. Please note that the existing home (house number 15124) actually appears to have drainage problems associated with roof drains, and not street drainage. As such, no additional mitigation has been proposed at this



location. Surface water runoff from the trail is a very minor amount, and all upstream runoff from the slope above the trail is being intercepted and drained southerly to the existing storm drainage system.

Segment B, Station 23+54 to 24+50

Recommendations:

- 1) Continue to slope trail towards lakeside along this stretch of trail.
- 2) Existing trench drain shall be re-used or replaced in-kind at upslope side of trail.
- 3) Provide vegetated flow path as BMP to the extent feasible.
- 4) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.

Segment B, Station 24+50 to 25+95

Recommendations:

- 1) Slope trail towards lakeside along this stretch of trail.
- 2) Provide vegetated flow path as BMP to the extent feasible.
- 3) Owners of downstream properties should maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.

Segment B, Station 25+95 to 27+23

Recommendations:

- 1) Install CB at intersection to intercept some of the offsite runoff, and direct to upslope conveyance system.
- 2) Provide vegetated flow path as BMP to the extent feasible.
- 3) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.



Segment B, Station 27+23 to 27+47

Recommendations:

- 1) Continue to slope trail towards lakeside at this crossing.
- 2) Existing asphalt berm shall be left in place. If disturbed during reconstruction of crossing, it would need to be replaced with a trench drain.
- 3) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR. Also, upon further review we are proposing to replace the existing berm with a trench drain.

Segment B, Station 27+47 to 29+00

Recommendations:

- 1) Slope trail towards lakeside along this stretch of trail.
- 2) Install perforated pipe in shallow trench under 3-foot gravel shoulder on lakeside of trail. Connect to existing 18-inch concrete culvert with new Type 1L CB.
- 3) Install 10-foot vegetated flowpath as backup BMP.
- 4) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations update the previous plans and TIR submitted to the City. Additional drainage controls have been included in the revised plans in accordance with these recommendations, including a detail of the perforated pipe section per the City's request.

Segment B, Station 29+00 to 29+44

Recommendations:

- 1) Continue to slope trail towards lakeside at this crossing.



- 2) Existing asphalt berm shall be left in place. If disturbed during reconstruction of crossing, it would need to be replaced with a trench drain.
- 3) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR. It appears that the asphalt berm will be disturbed and a trench drain will be utilized to handle drainage at this intersection.

Segment B, Station 29+44 to 30+73

Recommendations:

- 1) Slope trail towards lakeside along this stretch of trail.
- 2) Install perforated pipe in shallow trench under 3-foot gravel shoulder on lakeside of trail. Connect to proposed drainage pipe on upslope side of trail.
- 3) Install 10-foot vegetated flowpath as backup BMP.
- 4) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations update the previous plans and TIR submitted to the City. Additional drainage controls have been included in the revised plans in accordance with these recommendations, including a detail of the perforated pipe section per the City's request.

Segment B, Station 30+73 to 31+65

Recommendations:

- 1) Continue to slope trail towards lakeside at this crossing.
- 2) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.



Segment B, Station 31+65 to 33+00

Recommendations:

- 1) Slope trail towards lakeside along this stretch of trail.
- 2) Install 10-foot vegetated flowpath as BMP.
- 3) Owners of downstream properties should continue to maintain existing stormwater controls.

Discussion:

These recommendations do not change or conflict with 8/27/2007 TIR.

Attachments: HCWL Memorandum, 8/18/2009



HAMMOND COLLIER
WADE LIVINGSTONE
MEMORANDUM

Date: August 18, 2009

To: Stephen Bennett, AICP Planning Director, Lake Forest Park

From: Jason Henry, P.E.

Re: Burke Gilman Trail Redevelopment: Review of 100% plans and level 2 downstream analysis

We have reviewed the 100% Review Plan Set and the Level 2 Downstream Analysis submitted to the City for redevelopment of the Burke Gilman Trail through Lake Forest Park. Following are our comments.

Technical Information Report and Level 2 Downstream Analysis:

1. The technical information report for the project will need to be updated with the design revisions that are recommended in the level 2 down stream analysis. This includes discussion of the trail cross slope through stations 14+45 to 18+65, discussion of the underdrain system and other improvements added as a result of the level 2 downstream analysis. Station 14+45 appears to be a typo as it is within the section titled 17+00 to 17+45. Even so I would recommend beginning full cross slope to the west at station 17+00 to collect the added impervious area due to the intersection return and prevent surface water from upslope crossing between 17+00 and 17+45. The vertical geometry in this location will provide gutter flow to the low point at station 18+05 where surface water will be collected by the existing catch basin and conveyed to the lake.
2. Station 19+50 to Station 23+54. The downstream analysis states that the trail slopes to the west for most of the length through this section and identified a house that is currently experiencing flooding/surface water issues. The proposed mitigation does not appear to be adequate. The vegetated flow path is only 5 feet, half of what is required by code to qualify as a BMP. Because the flow patterns will be changing in this area and there is an existing drainage problem we would recommend the City request additional mitigation for surface flows.



HAMMOND COLLIER
WADE LIVINGSTONE

100% Review Plan Set:

1. Provide a detail of the perforated underdrain recommended in the level 2 downstream analysis and shown on the civil plan view sheets. The proposed 3/8 minus crushed rock shoulder compacted to 95% as detailed on sheet L5.2 will not allow water to infiltrate into the underdrain and will sheet flow across the shoulder. Please provide a material that will allow the runoff to be collected and routed to the storm system by the proposed underdrain.
2. On sheet C1.2 station 31+50, there is a driveway crossing the trail. There appears to be a small berm and/or depression adjacent to the trail that directs water to the ditch on the west side of the trail. At a minimum, please add the berm note to this location, however I do not see how the trail improvements will not alter this location and a trench drain should be provided per condition number 4 of the reconsideration of the conditions of approval.



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